Watershed Based Mitigation: A Whole Systems Approach

For many years, environmental regulations have focused on preserving individual elements of natural systems without considering the ecosystem as a whole. For instance, Section 402 of the Clean Water Act regulates stormwater discharge and is administered by the state's Department of Ecology; Section 404 of the Clean Water Act regulates development in and around wetlands and is administered by the federal Army Corps of Engineers; and the Endangered Species Act, which protects our salmon, is administered by the federal NOAA Fisheries. While each of these regulations endeavors to protect individual resources, opportunities exist for a coordinated approach that will allow greater protection and resource enhancement at a lower overall cost. This is the goal of Watershed Based Mitigation.

What is Watershed Based Mitigation?
Watershed Based Mitigation refers to a systematic approach of evaluating project impacts and mitigation options from an ecological function viewpoint. A central piece to Watershed Based Mitigation is the examination and prioritization of all potential mitigation sites located in a drainage sub-basin or watershed. By expanding the list of mitigation alternatives, ecological functions of the mitigation can be maximized while costs are kept to a minimum.

To achieve this goal, policy and technical issues must be considered to ensure that requirements of each regulation are met while addressing the complex interaction between regulations. WSDOT has been working closely with Ecology, WDFW, city and county representatives, tribal representatives and the US Army Corps of Engineers.

Watershed Based Mitigation and Project Evaluation Tools:
Due to the complex nature of this problem, several tools and approaches have been created to achieve watershed based mitigation. From a transportation project perspective, these tools are applied at different stages of a project's planning and design. The first tool developed was Watershed Characterization.

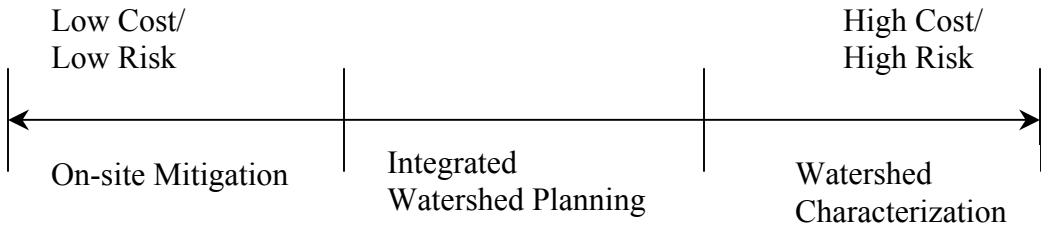
Watershed Characterization is a design tool for project engineers and environmental staff that provides a systematic approach to determining appropriate mitigation on a watershed scale. Watershed Characterization is applied to large or complex projects that are in mid to late stages of design and have identified on-site environmental mitigation as an issue of concern. Watershed characterization is typically applied to projects two to four years before construction is scheduled to start.

Watershed Characterization examines project impacts and mitigation opportunities in a broad watershed context. Detailed environmental information on the characteristics of a watershed is loaded into GIS datasets along with project design information. Watershed characterization includes the simultaneously analyzes of soil types, riparian systems,

wetland systems, groundwater flow, and other environmental qualities, identification of restoration opportunities within the sub-basin or watershed, and a functional examination of the unavoidable environmental impacts caused by a transportation project.

Watershed Screening Tool is also a design tool for WSDOT project engineers but is to evaluate project that will not be but for another four to six years. This tool will help engineers identify those projects with on-site physical constraints (hydrology, wetlands, soils, etc.), which will be easier to mitigate off-site using watershed based mitigation techniques. It is design to determine those projects that are candidate for more detailed Watershed Characterization work. Projects will be by environmental risk and potential mitigation cost. Those projects that are of high risk and high costs will be candidates for full Watershed Characterization. This tool is still in the development stage and has not yet been implemented.

Mitigation Cost and Environmental Risks

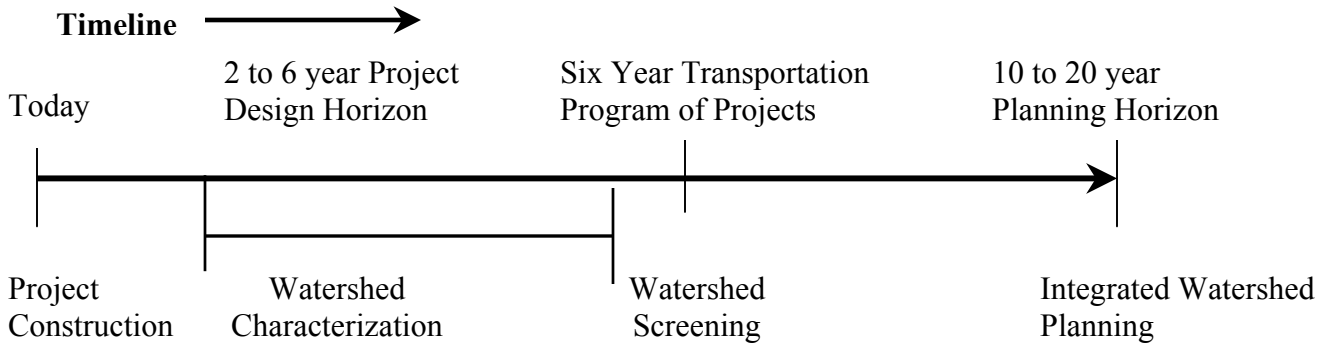


Integrated Watershed Planning

The final tool is Integrated Watershed Planning. Watershed planning establishes the critical needs of a watershed; identifies potential mitigation; rehabilitation and restoration sites; and ranks sites in priority order. While watershed planning is not essential to watershed based mitigation, it makes the projects proponents job much easier and ensures that the proposed mitigation solution has broader benefits than on-site project mitigation.

The following timeline summarizes the use of these tools.

Watershed Tools Timeline



Next Steps:
Watershed Based mitigation holds much promise, however implementing change in institutional methodologies and gaining acceptance of those changes will take time and effort. Field staff at WSDOT and resource agencies will be responsible for implementing watershed based mitigation including characterizing project impacts, identifying mitigation opportunities, and permitting projects that rely on watershed based mitigation. Broader understanding of these concepts and methodologies is needed as field staff will be ultimately responsible for the success of watershed based mitigation.

Funding for further development and implementation will need to rely more heavily on individual project budgets. Funding is also needed for monitoring and establishment of watershed based best management practices for stormwater.

Currently, WSDOT is working with consultants on the development of three new projects to use Integrated Watershed Planning. These include US 12 corridor in Walla Walla, and potentially SR 539 Ten Mile Road to the Border in Whatcom County and SR 4 Guardrail Replacement in Wahkiakum County. These projects will be coordinated to increase WSDOT's staff abilities in overall coordination of transportation projects with watershed planning.

The Watershed Screening tool should identify WSDOT projects that are good candidates for watershed characterization work.